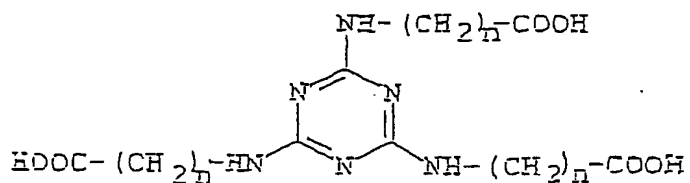


## Claims

- 5           1. Degradation-resistant polyamide producible by  
          anionic polymerisation of at least one lactam in  
          the presence of at least one basic catalyst and  
          if necessary at least one activator, with addi-  
10           tion of a desactivator after completed polymeri-  
          sation in the melt state,  
          characterised in that  
          the desactivator comprises a proton donor and an  
          amine.
- 15           2. Polyamide according to claim 1,  
          characterised in that the amine is a non-volatile  
          secondary or tertiary amine.
- 20           3. Polyamide according to claim 2,  
          characterised in that the amine is an N-  
          dimethylated fatty amine with 12 - 18 C atoms.
- 25           4. Polyamide according to claim 3,  
          characterised in that the amine function is  
          sterically hindered.
5. Polyamide according to claim 4,  
          characterised in that the amine is a HALS amine.
- 30           6. Polyamide according to at least one of the claims  
          1 to 5,  
          characterised in that the proton donor is an or-

ganic carboxylic acid or polycarboxylic acid.

- 5           7. Polyamide according to claim 6,  
characterised in that the organic carboxylic acid  
is present in the form of an oligomeric wax-like  
product, preferably as polyethylene wax, which  
contains carboxyl groups, or as a cooligomer or  
copolymer.
- 10          8. Polyamide according to claim 6,  
characterised in that the proton donor is an eth-  
ylene(meth)acrylic acid oligomer or polymer.
- 15          9. Polyamide according to claim 8,  
characterised in that the polymer is an ethyl-  
ene(meth)acrylic acid copolymer.
- 20          10. Polyamide according to claim 6,  
characterised in that the carboxylic acid is a  
copolymer with monomers containing acid groups,  
which occur partially as a salt (ionomers) and  
the cation is preferably  $\text{Zn}^{++}$ .
- 25          11. Polyamide according to at least one of the claims  
1 to 10,  
characterised in that the desactivator comprises  
a compound, which has at least one proton-  
donating group and at least one amino group.
- 30          12. Polyamide according to claim 11,  
characterised in that the desactivator is se-  
lected from compounds of the general formula I



with  $n = 1$  to 10, preferably 5.

13. Polyamide according to at least one of the claims 11 and 12, characterised in that a non-volatile secondary or tertiary amine is added in addition to the desactivator.
14. Polyamide according to at least one of the claims 1 to 13, characterised in that the polyamide has a relative viscosity  $\eta_{\text{rel}}$  of 1.5 - 4.0, measured in a 0.5% by weight solution in m-Cresol according to EN.ISO 307.
15. Polyamide according to at least one of the claims 1 to 14, characterised in that the lactam has 6 - 12 C atoms, preferably is lactam 6 and/or lactam 12 or a mixture thereof.
16. Polyamide according to at least one of the claims 1 to 15, characterised in that the catalyst is an alkali lactamate or a lactamate-forming compound.

17. Polyamide according to at least one of the claims  
1 to 16,  
characterised in that the activator is selected  
from the group of acylated lactams, isocyanates  
and carbodiimides which can be present also in  
capped or cyclised form.

18. Polyamide according to at least one of the claims  
1 to 17,  
characterised in that a liquid system, which con-  
tains the activator and the catalyst in a liquid  
polar aprotic solvation medium, is used for the  
polymerisation control.

19. Polyamide according to at least one of the claims  
1 to 18,  
characterised in that the polyamide is present as  
a granulate.

20. Polyamide according to at least one of the claims  
1 to 18,  
characterised in that the polyamide occurs as  
moulded articles in the form of injection mould-  
ing parts, fibres, films, plates, pipes, coat-  
ings, shaped or profile pieces.

21. Method for continuous production of a degrada-  
tion-resistant polyamide starting from the re-  
sulting polylactam comprising at least one lactam  
with addition of at least one basic catalyst and  
if necessary of at least one activator by means

of a polymerisation at a temperature between 140 and 320°C,

characterised in that

a proton donor and an amine is added to the resulting poly lactam in the melted aggregate state as desactivator.

22. Method according to claim 21, characterised in that the desactivator is added in the form of a melted master batch.

23. Method according to claim 21 or 22, characterised in that the method is implemented in a continuous mixer, e.g. in an extruder.

24. Method according to claim 23, characterised in that the method is implemented in a twin-screw extruder.

25. Method for processing polyamide or the polymer blend thereof, which was produced by anionic polymerisation of lactam in the presence of at least one basic catalyst and if necessary at least one activator, in which method the polyamide or the polymer blend thereof is melted and, before further processing, a proton donor and an amine is added to the melt in the molten state as desactivator.

26. Method according to claim 25, characterised in that the desactivator in the form of a master batch granulate is added before

remelting to a PA granulate produced via anionic polymerisation.

5           27. Method according to claim 25 and 26,  
characterised in that, after granulation of the  
polyamide, the desactivator is applied to the  
polyamide granulate by means of adhesion-promotor  
before processing into the moulded article.

10           28. Method according to at least one of the claims 25  
to 27,  
characterised in that the polyamide or the poly-  
mer blend thereof is comminuted before thermo-  
plastic conversion into the finished part as an  
15           intermediate method step and is present thereby  
as a granulate.

29. Method according to at least one of the claims 21  
to 28,  
20           characterised in that a non-volatile secondary or  
tertiary amine compound is used as amine.

30. Method according to claim 29,  
characterised in that the secondary amine com-  
25           pound carries at least one sterically hindered  
C<sub>1</sub> - C<sub>18</sub> alkyl group.

31. Method according to at least one of the claims 21  
to 30,  
30           characterised in that an organic carboxylic acid  
is used as proton-donating compound.

32. Method according to claim 31,  
characterised in that the proton donor is an  
acidic polyethylene wax in which the carboxylic  
acid is preferably part of the chain.

5

33. Polyamide according to claim 31 or 32,  
characterised in that the proton donor is an eth-  
ylene(meth)acrylic acid copolymer.

10

34. Polyamide according to at least one of the claims  
31 to 33,

characterised in that the proton donor is a co-  
polymer with monomers containing carboxylic acid  
groups, which monomers are present partially as a  
salt (ionomers), the cation preferably being  $Zn^{++}$ .

15

35. Method according to at least one of the claims 21  
to 34,

characterised in that the concentration of acidic  
groups (e.g.  $-COOH$ ) is at least as great as the  
basicity originating from the catalyst but  
smaller than the sum of the basicity and the con-  
centration of amine functions.

20

36. Method according to at least one of the claims 21  
to 35,

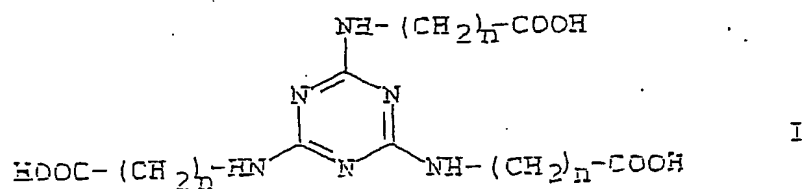
characterised in that a compound is used as de-  
sactivator which has at least one proton-donating  
group and at least one amine group.

25

30

37. Method according to claim 36,

characterised in that the compound is selected from the general formula I



with  $n = 1$  to  $10$ , preferably  $n = 5$ .

5

38. Method according to at least one of the claims 21 to 37,  
characterised in that the lactam has 6 - 12 C atoms, preferably lactam 6 and/or lactam 12.

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39. Method according to at least one of the claims 21 to 38,  
characterised in that the catalyst is an alkali lactamate or a compound forming a lactamate.

15

40. Method according to at least one of the claims 21 to 39,  
characterised in that the activator is selected from the group of acylated lactams, isocyanates and carbodiimides, which can also be present in capped or cyclised form.

20

41. Method according to at least one of the claims 21 to 40,  
characterised in that a catalytically acting liquid system is used for the polymerisation control, in which system the activator and the cata-

25



lyst are contained in a liquid polar aprotic solvation medium.

5           42. Method according to at least one of the claims 21 to 41,  
characterised in that the desactivator, if necessary with further additives, is added in the form of a master batch, the master batch carrier being a thermoplastic.

10           43. Method according to claim 42,  
characterised in that the master batch is produced by incorporation of the desactivator components in the melt of a thermoplastic and the  
15           thermoplastic is preferably polyamide and the master batch can contain further additives, in particular stabilisers.

20           44. Use of the method according to at least one of the claims 21 to 43 for producing granulate for the further thermoplastic processing into polyamide moulded articles, or for direct production of moulded articles.

25           45. Use of the method according to at least one of the claims 25 to 43 for recycling polyamide or the polymer blends thereof.